

Journal of Catalysis

EDITORS:

W. Keith Hall

Frank S. Stone

EDITORIAL BOARD:

R. B. Anderson

M. Boudart

R. L. Burwell, Jr.

J. B. Butt

A. Cimino

R. P. Eischens

P. C. Gravelle

G. W. Keulks

H. Knözinger

M. Kraus

J. H. Lunsford

A. Nielsen

J. F. Roth

W. M. H. Sachtler

J. J. F. Scholten

P. W. Selwood

G. V. Smith

K. Tamaru

S. J. Thomson

P. B. Weisz

P. B. Wells

Volume 80 • 1983



ACADEMIC PRESS

A Subsidiary of Harcourt Brace Jovanovich, Publishers

New York London

Paris San Diego San Francisco São Paulo Sydney Tokyo Toronto

Copyright © 1983 by Academic Press, Inc.

All Rights Reserved

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from the copyright owner.

The appearance of the code at the bottom of the first page of an article in this journal indicates the copyright owner's consent that copies of the article may be made for personal or internal use, or for the personal or internal use of specific clients. This consent is given on the condition, however, that the copier pay the stated, per copy fee through the Copyright Clearance Center, Inc. (21 Congress Street, Salem, Massachusetts 01970), for copying beyond that permitted by Sections 107 or 108 of the U.S. Copyright Law. This consent does not extend to other kinds of copying, such as copying for general distribution, for creating new collective works, or for resale. Copy fees for pre-1983 articles are as shown on the article title pages; if no fee code appears on the title page, the copy fee is the same as for current articles.

0021-9517/83 \$3.00

MADE IN THE UNITED STATES OF AMERICA

Contents of Volume 80

Number 1, March 1983

| | |
|--|-----|
| J. B. FRIEDRICH, M. S. WAINWRIGHT, AND D. J. YOUNG. Methanol Synthesis over Raney Copper-Zinc Catalysts. I. Activities and Surface Properties of Fully Extracted Catalysts | 1 |
| J. B. FRIEDRICH, D. J. YOUNG, AND M. S. WAINWRIGHT. Methanol Synthesis over Raney Copper-Zinc Catalysts. II. Activities and Surface Properties of a Partially Leached Alloy..... | 14 |
| L. CAIRATI AND F. TRIFIRÒ. SiO ₂ and Al ₂ O ₃ as Oxidation Catalysts of Methanol . | 25 |
| YURIKO NITTA, TOSHINOBU IMANAKA, AND SHIICHIRO TERANISHI. Kinetic Studies of Enantioselective Hydrogenation of Methyl Acetoacetate on Modified Ni-SiO ₂ Catalyst | 31 |
| D. M. JONES AND G. L. GRIFFIN. Saturation Effects in Temperature-Programmed Desorption Spectra Obtained from Porous Catalysts | 40 |
| RASIK RAYTHATHA AND T. J. PINNAVAIA. Clay Intercalation Catalysts Interlayered with Rhodium Phosphine Complexes. Surface Effects on the Hydrogenation and Isomerization of 1-Hexene | 47 |
| EZEKIEL O. ODEBUNMI AND DAVID F. OLLIS. Catalytic Hydrodeoxygenation. I. Conversions of <i>o</i> -, <i>p</i> -, and <i>m</i> -Cresols..... | 56 |
| EZEKIEL O. ODEBUNMI AND DAVID F. OLLIS. Catalytic Hydrodeoxygenation. II. Interactions between Catalytic Hydrodeoxygenation of <i>m</i> -Cresol and Hydrodesulfurization of Benzothiophene and Dibenzothiophene..... | 65 |
| EZEKIEL O. ODEBUNMI AND DAVID F. OLLIS. Catalytic Hydrodeoxygenation. III. Interactions between Catalytic Hydrodeoxygenation of <i>m</i> -Cresol and Hydrodenitrogenation of Indole | 76 |
| HAKZE CHON, GON SEO, AND B. J. AHN. Interaction of Furans with Cu(II)Y Zeolite Catalysts..... | 90 |
| TEIJI CHIHARA AND KAZUNORI TANAKA. Substituent Effects in Heterogeneous Catalysis. IX. Adsorption Strength and Reactivity of 4-Substituted Cyclohexanones in Platinum-Metal-Catalyzed Hydrogenation..... | 97 |
| AKIRA MIYAMOTO, TOSHIKI UI, AND YUICHI MURAKAMI. Determination of the Number of Active Oxygen Species on the Surface of Cr ₂ O ₃ Catalysts | 106 |
| MOHAMED I. ZAKI AND NORMAN SHEPPARD. An Infrared Spectroscopic Study of the Adsorption and Mechanism of Surface Reactions of 2-Propanol on Ceria . | 114 |
| KAREL SETÍNEK, VÁCLAV BLAŽEK, JIŘÍ HRADIL, FRANTIŠEK ŠVEC, AND JAROSLAV KÁLAL. Reactive Polymers. XLII. Catalytic Activity of Macroporous Methacrylate Copolymers Containing Sulfopropyl Groups in Reesterification of Ethyl Acetate by 1-Propanol | 123 |
| J. P. VAN DEN BERG, J. P. WOLTHUIZEN, A. D. H. CLAGUE, G. R. HAYS, R. HUIS, AND J. H. C. VAN HOOFF. Low-Temperature Oligomerization of Small Olefins on Zeolite H-ZSM-5. An Investigation with High-Resolution Solid-State ¹³ C-NMR | 130 |

| | |
|---|-----|
| J. P. VAN DEN BERG, J. P. WOLTHUIZEN, AND J. H. C. VAN HOOFF. Reaction of Small Olefins on Zeolite H-ZSM-5. A Thermogravimetric Study at Low and Intermediate Temperatures | 139 |
| J. J. L. HEINERMAN, I. L. C. FRERIKS, J. GAAF, G. T. POTT, AND J. G. F. COOLEGEM. The Catalytic Activity of Nickel-Substituted Mica Montmorillonite | 145 |
| GEOFFREY COLLIER, DAVID J. HUNT, S. DAVID JACKSON, RICHARD B. MOYES, IAN A. PICKERING, PETER B. WELLS, ALAN F. SIMPSON, AND ROBIN WHYMAN. Chemisorption and Catalysis by Metal Clusters. I. Characterisation of Materials Obtained by Impregnation of $\text{Os}_3(\text{CO})_{12}$ and $\text{Os}_6(\text{CO})_{18}$ onto Silica, Alumina, and Titania | 154 |
| CHIAZUAN JEFF WANG AND JOHN G. EKERDT. Study of Fischer-Tropsch Synthesis over Fe/SiO_2 : Reactive Scavenging with Pyridine and Cyclohexene | 172 |
| MONICA GROSMAN AND DANIEL G. LÖFFLER. Kinetics of Ammonia Decomposition on Polycrystalline Tungsten | 188 |
| W. S. BORGHARD AND M. BOUDART. The Textural Promotion of Metallic Iron by Alumina | 194 |
| P. TSAI AND J. R. ANDERSON. Reaction of Acetylene over ZSM-5-Type Catalysts | 207 |

NOTES

| | |
|--|-----|
| D. J. COATES, J. W. EVANS, A. L. CABRERA, G. A. SOMORJAI, AND H. HEINEMANN. An Electron Microscopy Study of the Low Temperature Catalyzed Steam Gasification of Graphite | 215 |
| A. E. HUGHES, K. G. WILSHIER, B. A. SEXTON, AND P. SMART. Aluminum Distribution in ZSM-5 as Determined by X-Ray Photoelectron Spectroscopy | 221 |
| RUBY CID, RENAN ARRIAGADA, AND FRESIA ORELLANA. Zeolites Surface Area Calculation from Nitrogen Adsorption Data | 228 |
| IAN D. GAY. Highly Disperse Ruthenium-Silica Catalysts | 231 |

Number 2, April 1983

| | |
|---|-----|
| RICHARD D. KELLEY, GEORGE A. CANDELA, THEODORE E. MADEY, DALE E. NEWBURY, AND RICHARD R. SCHEHL. Surface and Bulk Analysis of a Deactivated Raney Nickel Methanation Catalyst | 235 |
| GIOVANNA GHIOTTI, EDOARDO GARRONE, GIUSEPPE DELLA GATTA, BICE FUBINI, AND ELIO GIAMELLO. The Chemistry of Silica-Supported Chromium Ions: Calorimetric and Spectroscopic Study of Nitric Oxide Adsorption | 249 |
| JACEK ZIÓŁKOWSKI. Catalytic Anisotropy of MoO_3 in Oxidation Reactions in the Light of Bond-Strength Model of Active Sites | 263 |
| C. G. TAKOUDIS AND L. D. SCHMIDT. Kinetics of N_2O Decomposition on Polycrystalline Platinum | 274 |
| P. HOU, D. MEEKER, AND H. WISE. Kinetic Studies with a Sulfur-Tolerant Water Gas Shift Catalyst | 280 |
| HELGE JEZIOROWSKI, HELMUT KNÖZINGER, EDMUND TAGLAUER, AND CLAUS VOGDT. Low Energy Ion Scattering Study of $\text{Ni-Mo-Al}_2\text{O}_3$ Catalysts | 286 |
| J. A. DON, A. P. PIPERS, AND J. J. F. SCHOLTEN. Preparation and Surface Characterization of Nonsupported Ruthenium Catalysts | 296 |
| YASUKO NAKANO, TSUTOMU YAMAGUCHI, AND KOZO TANABE. Hydrogenation of Conjugated Dienes over ZrO_2 by H_2 and Cyclohexadiene | 307 |

| | |
|--|-----|
| G. B. McVICKER, C. J. KIM, AND J. J. EGGERT. Properties of Aluminum-Fluoride Catalysts Prepared by the Fluoridation of Aluminum Oxide with Trifluoromethane | 315 |
| E. FIOLITAKIS AND H. HOFMANN. Dependence of the Kinetics of the Low-Temperature Water-Gas Shift Reaction on the Catalyst Oxygen Activity as Investigated by Wavefront Analysis | 328 |
| EDUARDO A. LOMBARDO, KAZUNORI TANAKA, AND ISAMU TOYOSHIMA. XPS Characterization of Reduced LaCoO ₃ Perovskite | 340 |
| H. GRISEBACH AND J. B. MOFFAT. The Liquid-Phase Dehydration of <i>tert.</i> -Butyl Alcohol on B-P-O Catalysts | 350 |
| ROBERT L. AUGUSTINE AND ROBERT W. WARNER. A Facile Technique for the Surface Characterization of Dispersed Metal Catalysts | 358 |
| G. L. SCHRADER AND C. P. CHENG. <i>In Situ</i> Laser Raman Spectroscopy of the Sulfiding of Mo/ γ -Al ₂ O ₃ Catalysts | 369 |
| J. C. DUCHET, E. M. VAN OERS, V. H. J. DE BEER, AND R. PRINS. Carbon-Supported Sulfide Catalysts | 386 |
| JUAN O. PETUNCHI AND W. KEITH HALL. Studies of a CuY Zeolite as a Redox Catalyst | 403 |
| E. BAUMGARTEN, D. HOLLENBERG, AND H. HÖFFKES. Skeletal Isomerization of Hexenes on γ -Alumina | 419 |
| E. SANTACESARIA, D. GELOSA, P. DANISE, AND S. CARRÀ. Vapor-Phase Esterification Catalyzed by Decationized Y Zeolites | 427 |
| B. HORI, N. TAKEZAWA, AND H. KOBAYASHI. Dual Routes of the Reaction between Nitrous Oxide and Carbon Monoxide over SnO ₂ as Revealed by the Transient-Response Method | 437 |
| R. KRAMER AND H. ZUEGG. The Hydrogenolysis of Methylcyclopentane on Platinum Model Catalysts: Particle Size Effect Due to a Reaction Occurring at the Phase Boundary Metal-Support | 446 |

NOTES

| | |
|---|-----|
| H. LECHERT, C. DIMITROV, C. BEZUHANOVA, AND V. NENOVA. Infrared Spectral Characteristics of the Interaction of Olefins with H-ZSM-5 Zeolite ... | 457 |
| C. FRAGALE, M. GARGANO, AND M. ROSSI. Selective Hydrogenation of 1,3-Cyclooctadiene and Diphenylacetylene on Copper Using the Water-Gas Shift Reaction as a Hydrogen Source | 460 |
| V. YU. BOROVKOV, A. A. ALEXEEV, AND V. B. KAZANSKY. On the Nature of Strong Acidic Brønsted Sites of Amorphous Silica-Aluminas | 462 |
| JULIUS SCHERZER. Characteristics of Zeolite-Supported Iron Catalysts Prepared from Iron Cyanide Complexes | 465 |
| YUZURU TAKAGI, SATORU YADA, AND KAZUNORI TANAKA. Mechanistic Studies on the Reaction of Alicyclic Ketones with Deuterium over Platinum Group Metals; Propagation of α,β -Process on Rh and Formation of π -Allylic Species on Pd | 469 |
| SE H. OH AND JOYCE E. CARPENTER. The Oxidation State and Catalytic Activity of Supported Rhodium | 472 |
| J. PIELASZEK, J. B. COHEN, R. L. BURWELL, JR., AND J. B. BUTT. Catalyst Size Distributions from X-Ray Diffraction | 479 |
| D. E. PEEBLES, J. R. CREIGHTON, D. N. BELTON, AND J. M. WHITE. Coadsorption of Hydrogen and Carbon Monoxide on Nickel and Platinum | 482 |
| CHARLES N. SATTERFIELD, GEORGE A. HUFF, JR., AND ROBERT SUMMERHAYES. Olefin Addition in Fischer-Tropsch Synthesis on an Iron Catalyst | 486 |

LETTERS TO THE EDITORS

| | |
|---|-----|
| J. DEVANNEAUX AND J. MAURIN. Hydrogenation and Hydrogenolysis of Thiophenic Compounds: Correction and Comments..... | 491 |
| ROGER F. VOGEL AND GEORGE MARCELIN. Preparation of Stoichiometric Aluminum Phosphate | 492 |
| HIDENOBU ITOH, AKIO TADA, AND HIDESHI HATTORI. A Response to Vogel and Marcelin | 494 |
| J. B. MOFFAT AND B. GALLACE. Preparation of Stoichiometric Phosphates and the Effect of pH | 496 |
| AUTHOR INDEX FOR VOLUME 80..... | 497 |

The Subject Index for Volume 80 will appear in the December 1983 issue as part of a cumulative index for the year 1983.